

**PROPOSED NEGATIVE DECLARATION**  
**AB 970 ENERGY EFFICIENCY STANDARDS**  
**FOR APPLIANCES**

**January 9, 2002**

On September 6, 2000, Governor Gray Davis signed emergency legislation, Assembly Bill 970, the California Energy Security and Reliability Act of 2000. The purpose of this legislation was to provide a balanced response to the state's electricity problems, to create significant investments in new, environmentally superior electricity generation, and to increase new investments in conservation and demand-side management programs to meet future energy needs of the State of California. Among other items, the bill provides the following direction to the Energy Commission:

“Public Resources Code 25553. Notwithstanding any other provision of law, on or before 120 days after the effective date of this section or on the earliest feasible date thereafter, the commission shall take...the following actions:

...

(b) Adopt and implement updated and cost-effective standards pursuant to Section 25402 to ensure the maximum feasible reductions in wasteful, uneconomic, inefficient or unnecessary consumption of electricity.”

In the late 1970s, the Energy Commission developed energy efficiency standards for appliances, codified as Title 20, Division 2, Chapter 4, Article 4, Sections 1601-1608, of the California Code of Regulations, and has been periodically revising them since then. AB 970 calls for strengthening these appliance standards. Several documents describe the proposed changes:

- *California Energy Commission Express Terms (45-Day Language), Proposed Amendments to California Code of Regulations, Title 20, Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations and California Code of Regulations, Title 24, Part 6, Subchapter 2, Sections 110-111: Building Standards*, which contains the language changes to the standards; and
- *Initial Study, Environmental Checklist, and Proposed Negative Declaration, AB 970 Energy Efficiency Standards for Appliances* (attached), which lists in Appendix A the current and proposed changes.

Existing law [Public Resources Code Sections 25402(a)-(b)] also requires the Commission to adopt standards for energy efficiency in buildings; the current building standards state that buildings must comply with specified provisions of the appliance regulations. The proposed changes described in the relevant associated documents are for both the appliance standards and the appropriate sections of the building standards.

## PROPOSED FINDING

The analysis for the proposed changes to energy efficiency standards indicates no significant impact on the environment. The Commission finds that the adoption of the proposed standards, including amendments and repeals of existing standards, will result in no significant adverse environmental effect. The attached *Initial Study, Environmental Checklist, and Proposed Negative Declaration* documents this finding.

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WILLIAM J. KEESE  
Chair  
California Energy Commission

DATE:\_\_\_\_\_

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MICHAEL C. MOORE  
Commissioner  
California Energy Commission

DATE:\_\_\_\_\_

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ROBERT A. LAURIE  
Commissioner  
California Energy Commission

DATE:\_\_\_\_\_

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ROBERT PERNELL  
Commissioner  
California Energy Commission

DATE:\_\_\_\_\_

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ARTHUR H. ROSENFELD  
Commissioner.  
California Energy Commission

DATE:\_\_\_\_\_

INITIAL STUDY, ENVIRONMENTAL CHECKLIST,  
and  
PROPOSED NEGATIVE DECLARATION

AB 970 ENERGY EFFICIENCY STANDARDS  
FOR APPLIANCES

CALIFORNIA ENERGY COMMISSION

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# AB 970 ENERGY EFFICIENCY STANDARDS FOR APPLIANCES

## I. BACKGROUND

### A. Brief History of the Appliance Standards

The oil crises of the 1970s sparked new ideas and strategies for saving energy even beyond use of oil. The California Energy Commission was created by the Warren-Alquist Act of 1974 to develop and implement energy policy for California. One of the Commission's mandates in the Warren-Alquist Act was to promote energy efficiency and a wide range of energy conservation programs and regulations. Appliance efficiency standards came out of this mandate, and the first standards took effect in 1977. The affected appliances then included residential refrigerators and freezers, room air conditioners, and residential central air conditioners. In subsequent years, more appliances were added: commercial refrigerators and freezers, commercial central air conditioners, spot air conditioners, gas space heating equipment, water heaters, plumbing fixtures, fluorescent lamp ballasts, and residential cooking appliances. The appliance standards included testing, reporting, and enforcement provisions. A number of new appliances are being added in 2002 under Assembly Bill 970 (see Section II below for a listing of those appliances).

Like the efficiency standards for new buildings, the appliance standards established a *minimum* level of efficiency. More efficient appliances could be used, which would result in additional energy savings.

Since their inception, the appliance standards, along with standards for energy efficient buildings, have helped Californians save more than \$15.8 billion in electricity and natural gas costs. Energy Commission analysts estimate that that number will climb an additional \$43 billion by 2011.<sup>1</sup> These savings and energy use reductions result in environmental benefits not only in California, but also in other parts of the western United States from which California imports energy.

### B. Reasons for This Project

During the year 2000, California experienced electricity supply alerts on thirty-two hot days between May 21 and September 21. During the hottest times of the day, approximately noon to 8 p.m., air conditioners all over the state put a strain on the electricity supply system. A number of factors contributed to this situation:

- few new power plants were built in California in preceding years because of the uncertainty about electricity industry deregulation;
- surrounding states were suffering in the heat as well, competing for electricity supplies; and
- California and other parts of the west had experienced significant population and economic growth in recent years.

On these thirty-two "Power Watch" days, the major electric utilities in California reported that reserve margins of electricity grew dangerously small. Stage One or Two alerts<sup>2</sup> were called,

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<sup>1</sup> Cited on the California Energy Commission's website, <http://www.energy.ca.gov/title24/index.html>.

<sup>2</sup> A Stage One Alert or Emergency takes effect when electricity-operating reserves fall below seven percent. A Stage Two is declared when reserves fall below five percent; large commercial customers who volunteer to curtail power at times of

citizens and companies were asked to conserve, the utilities implemented a variety of emergency measures to help alleviate the strain, and wholesale prices of electricity skyrocketed. In the San Diego region, consumers' electricity bills doubled and in some cases tripled because retail rates were no longer subject to the rate freeze implemented in electric utility restructuring.

On several Power Watch days, the utilities implemented rolling electrical blackouts. Unplanned power outages – unreliability of the grid system – can be costly for many businesses in California. KLA-Tencor, for example, a semiconductor equipment manufacturer, determined that a single power outage cost the company \$8 million in lost production, labor, and equipment.<sup>3</sup>

On September 6, 2000, Governor Gray Davis signed emergency legislation, Assembly Bill 970 (AB 970), the California Energy Security and Reliability Act of 2000. The purpose of this legislation was to provide a balanced response to the state's electricity problems, to create significant investments in new, environmentally superior electricity generation, and to increase new investments in conservation and demand-side management programs to meet future energy needs.

One of the AB 970 mandates for the Commission was to adopt and implement cost effective amendments to the California appliance efficiency standards, codified as Title 20, Division 2, Chapter 4, Article 4, Sections 1601-1608 of the California Code of Regulations. AB 970 mandated that the Commission adopt and implement the new standards in 120 days or on the earliest feasible date thereafter.

The California Environmental Quality Act (Public Resources Code, Sections 21000 et seq.), referred to as "CEQA," requires public agencies to identify and consider the environmental effects of their "projects," as that term is defined, and when feasible to mitigate any related adverse environmental consequences. The Energy Commission's adoption of regulations is a project as defined under CEQA. The Commission has therefore included in this Initial Study the results of analyses of potential significant effects of the proposed appliance standards amendments on the environment.

## **II. PROPOSED PROJECT**

With input from outside stakeholders, Energy Commission staff identified a number of measures for consideration as changes to the Title 20 appliance standards. The proposed changes of the project establish or amend the levels of efficiency for the following appliances:

- beverage vending machines,
- commercial refrigerators, including refrigerator-freezers and freezers, with transparent and solid doors,
- emergency lighting (illuminated exit signs),
- traffic signals (green, red, and amber lights, and turn arrows),
- torchiere lamps,

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high demand are asked to do so. A Stage Three is declared when reserves are less than one and a half percent; utilities sometimes initiate rolling blackouts to preserve grid integrity.

<sup>3</sup> This figure is from The Power Quality Group, an alliance between E-Source and Electrotek. See Appendix B for the complete citation.

- commercial clothes washers,
- bathtub spout diverters,
- low-voltage dry distribution transformers,
- residential central air conditioners and heat pumps, and
- commercial central air conditioners and heat pumps.

The proposed efficiency standards and the rationale for each amendment are discussed in the Commission's Initial Statement of Reasons (ISOR) for this rulemaking, entitled *California Energy Commission Initial Statement of Reasons for Proposed Amendments to California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4: Appliance Efficiency Regulations and California Code of Regulations, Title 24: Part 6, Subchapter 2: Building Standards*, Docket No. 01-AB970-APSTD, November 2001. The results of the Commission's cost-effectiveness analyses for the proposed changes are contained in *2001 Update, Assembly Bill 970 Draft Appliance Efficiency Standards, Life Cycle Cost Analysis*, Publication No. 400-01-028, Docket No. 01-AB970-APSTD, November 2001. Both documents are available on the Commission's website, [www.energy.ca.gov/appliances/documents/index.html](http://www.energy.ca.gov/appliances/documents/index.html), and in hard copy or by electronic mail from the Commission's Residential Buildings and Appliances Office (916/654-4066, [dfriese@energy.state.ca.us](mailto:dfriese@energy.state.ca.us)).

The proposed changes to substantive efficiency standards are for Title 20, Division 2, Chapter 4, Article 4, Sections 1601 to 1608 of the California Code of Regulations. Some proposed changes to the substantive standards in Section 1605.1 reflect changes in Federal law and need not be discussed here. Similarly, there are changes to the implementing procedural regulations, but they cannot have any environmental effect so they too are not discussed (the implementing regulations are in Sections 1601-1605 and 1606-1608).

### **III. NO PROJECT**

If the Energy Commission did not strengthen the energy efficiency standards for appliances through this project, California would not reduce its summer peak demand by over 124 megawatts (MW) and its yearly electricity consumption by 2,042 gigawatt-hours (GWh). Also, California would continue the annual release of criteria air pollutants from power plants across the Western states as follows: oxides of nitrogen (NO<sub>x</sub>) by 391 tons, carbon dioxide (CO<sub>2</sub>) by 1.2 million tons, and PM10 (particulate matter ten microns or smaller) by 61 tons. (Power plants that supply electricity to California are located in and outside of California, so the benefits from emissions reductions are scattered around the Western states.)

## **IV. ENERGY AND ENVIRONMENTAL IMPACTS OF PROPOSED CHANGES**

### **A. Energy Impacts**

All of the energy effects are positive; that is, the proposed changes reduce the use of energy with no significant change in embodied energy. The proposed efficiency changes were selected to respond to the mandate in AB 970 to “ensure the maximum feasible reductions in wasteful, uneconomic, inefficient, or unnecessary consumption of electricity.” Peak demand savings from the proposed changes are estimated at 124 MW, and the total savings in electricity use are estimated at 2,042 GWh per year. Both values represent first year savings and do not reflect the cumulative effects over the years.

### **B. Environmental Impacts**

The Commission completed an environmental checklist to address CEQA issues on this project (see Section VI of this Initial Study). The results of this analysis show that implementing the new appliance efficiency standards will have no negative impacts on environmental quality. In fact, the new standards will result in major environmental benefits due to reductions in electricity use in residential and nonresidential appliances and consequent electricity emissions reductions at power plants in California and other Western States.

## **V. CONCLUSIONS AND RECOMMENDATIONS**

Since the analysis for the proposed changes to energy efficiency standards for appliances has shown that there will be no significant impact on the environment, staff recommends approval of the changes to help alleviate California’s electricity crisis in the coming years. Staff also recommends that the Commission adopt the Negative Declaration for the project.



## VI. Environmental Checklist

Project title	AB 970 Appliance Standards
Lead agency name and address	California Energy Commission 1516 Ninth Street Sacramento, California 95814
Contact person and phone number	<ul style="list-style-type: none"> <li>▪ Valerie Hall, Manager, Residential Buildings and Appliances Office, Efficiency and Demand Analysis Division (EEDAD), (916) 654-5109, &lt;vhall@energy.state.ca.us&gt;</li> <li>▪ Michael Martin, Project Engineer, Appliance Efficiency Standards, EEDAD, (916) 654-4039, &lt;mmartin@energy.state.ca.us&gt;</li> <li>▪ Tony Rygg, CEQA Manager, EEDAD, (916) 653-7271, &lt;trygg@energy.state.ca.us&gt;</li> </ul>
Project Description	The Commission is proposing changes to the appliance efficiency standards as mandated by AB 970.
Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement)	None

### ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below could potentially have been affected by this project, involving at least one impact that is a "Potentially Significant Impact" or change as indicated by the checklist on the following pages. However, the analysis reveals no significant adverse impacts.

	I. Aesthetics	x	VII. Energy		XIII. Noise
	II. Agriculture Resources		VIII. Hazards & Hazardous Materials		XIV. Population/ Housing
x	III. Air Quality		IX. Hydrology / Water Quality		XV. Public Services
	IV. Biological Resources		X. Land Use/ Planning		XVI. Recreation
	V. Cultural Resources		XI. Mineral Resources		XVII. Transportation/ Traffic
	VI. Geology /Soils		XII. Natural Resources		XVIII. Utilities/Service Systems
				x	XIX. Mandatory Findings of Significance

Issues:

	Potentially Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
<b>I. AESTHETICS --</b> Would the project:				
a) Have a substantial adverse effect on a scenic vista?				X
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?				X
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				
<b>II. AGRICULTURE RESOURCES --</b> In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				
<b>III. AIR QUALITY --</b> Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?				X

	Potentially Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?				X
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?				X
d) Expose sensitive receptors to substantial pollutant concentrations?				X
e) Create objectionable odors affecting a substantial number of people?				X
<b>Improvements in the energy efficiency of appliances will have no impact to the concerns listed above. The appliance standards changes will result in <u>reduced</u> power plant operation (in California and the Western United States) compared to existing appliance standards. Reduced power plant operation in turn results in <u>fewer</u> emissions of criteria and non-criteria pollutants.</b>				
<b>IV. BIOLOGICAL RESOURCES -- Would the project:</b>				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?				X
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?				X
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				X
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with estab-				X

	Potentially Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
lished native resident or migratory wild- life corridors, or impede the use of native wildlife nursery sites?				
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				
<b>V. CULTURAL RESOURCES -- Would the project:</b>				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?				X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?				X
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X
d) Disturb any human remains, including those interred outside of formal cemeteries?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				
<b>VI. GEOLOGY AND SOILS -- Would the project:</b>				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				X
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii) Strong seismic ground shaking?				X
iii) Seismic-related ground failure, including liquefaction?				X

	Potentially Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
iv) Landslides?				X
b) Result in substantial soil erosion or the loss of topsoil?				X
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				
VII. <b>ENERGY</b> -- Would the project:				
a) Use exceptional amounts of fuel or energy?				X
b) Increase demand upon existing sources of energy, or require the development of new sources of energy?				X
<b>Improvements in the energy efficiency of appliances will result in <u>reduced</u> energy use.</b>				
VIII. <b>HAZARDS AND HAZARDOUS MATERIALS</b> -- Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				X
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?				X
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d) Be located on a site which is included on a list of hazardous materials sites				X

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				
<b>IX. HYDROLOGY AND WATER QUALITY -- Would the project:</b>				
a) Violate any water quality standards or waste discharge requirements?				X
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				X

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?				X
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?				X
f) Otherwise substantially degrade water quality?				X
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?				X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Inundation by seiche, tsunami, or mudflow?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				
<b>X. LAND USE AND PLANNING -- Would the project:</b>				
a) Physically divide an established community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				

	Potentially Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
<b>XI. MINERAL RESOURCES</b> -- Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X
<b>Improvements in the energy efficiency of appliances will have no adverse impact to any of the concerns listed above.</b>				
<b>XII. NATURAL RESOURCES</b> -- Would the project result in:				
a) Significant increase in the rate of use of any natural resources?				X
b) Significant depletion of any non-renewable natural resource?				X
<b>Improvements in the energy efficiency of appliances will have no negative impact to any of the concerns listed above. The standards will reduce the rate of use and depletion of natural resources.</b>				
<b>XIII. NOISE</b> -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				X
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?				X
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?				X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X



	Potentially Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				
<b>XIV. POPULATION AND HOUSING</b> -- Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				
<b>XV. PUBLIC SERVICES</b> -- Would the project:				
Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				X
Fire protection?				X
Police protection?				X
Schools?				X
Parks?				X
Other public facilities?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				
<b>XVI. RECREATION</b> -- Would the project:				
a) Increase the use of existing neighborhood and regional parks or				X

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				
<b>XVII. TRANSPORTATION AND TRAFFIC -- Would the project:</b>				
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?				X
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?				X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e) Result in inadequate emergency access?				X
f) Result in inadequate parking capacity?				X
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X
<b>Improvements in the energy efficiency of appliances will have no impact to any of the concerns listed above.</b>				
<b>XVIII. UTILITIES AND SERVICE SYSTEMS -- Would the project:</b>				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X

	Potentially Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers' existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the projects solid waste disposal needs?				X
g) Comply with federal, state, and local statutes and regulations related to solid waste?				X
<b>Improvements in the energy efficiency of appliances will have no adverse impact to any of the concerns listed above. By reducing water use, the proposed commercial clothes washer and tub spout diverter standards will have beneficial effects on water supply and wastewater treatment.</b>				
<b>XIX. MANDATORY FINDINGS OF SIGNIFICANCE</b>				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				X
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either				X

	Potentially Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
directly or indirectly?				
<b>Improvements in the energy efficiency of appliances standards result in reduced power plant operation and reduce the need to build power plants in the future in California and the Western States.</b>				

DETERMINATION:

On the basis of this evaluation:

<b>X</b>	I find that the proposed project WILL NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

\_\_\_\_\_  
STEVE LARSON  
Executive Director  
California Energy Commission

DATE\_\_\_\_\_

## Appendix A - Matrix of Proposed Changes to Appliance Efficiency Standards under AB 970 and Resulting Energy and Environmental Effects<sup>4</sup>

	Appliance Type	Existing Standard	Proposed Standard or Description of Changes	Estimated Energy Effects <sup>5</sup>	Potential Environmental Issues <sup>5,6</sup>
1	Refrigerated Beverage Vending Machines (lighting only)	No current standard	<p>Require all new beverage vending machine lights to be T-8 type fluorescent lamps with electronic ballast.</p> <p>Equipment Modifications: lights in vending machines must be T-8 lamps and electronic ballasts.</p>	<p>Number of new units sold in California annually: 47,250</p> <p>Coincident demand factor: 100%</p> <p>Energy savings per individual unit: 351 kWh/yr</p> <p>Energy savings for this class of appliance: 17 GWh/yr</p> <p>Peak demand savings: 2 MW</p>	<p>EMISSIONS: Emissions reductions in Western states due to reduced electricity demand:</p> <p>NO<sub>x</sub> reduction: 3.2 tons/yr CO<sub>2</sub> reduction: 9,950 tons/yr PM10 reduction: 0.5 tons/yr</p> <p>MATERIALS: lamp change will reduce materials use. Switching from magnetic to electronic ballast will reduce demand for copper. The increased demand caused for electronic components will be insignificant - a very small fraction of California market requirements. No significant effects on the environment.</p>

<sup>4</sup> Documentation for the numbers in this matrix is listed in Appendix B.

<sup>5</sup> All energy savings and environmental effects are calculated based on first year sales only.

<sup>6</sup> The quantities of emissions were calculated using the emissions factors listed in Table 1 of Appendix B.

	<b>Appliance Type</b>	<b>Existing Standard</b>	<b>Proposed Standard or Description of Changes</b>	<b>Estimated Energy Effects<sup>5</sup></b>	<b>Potential Environmental Issues<sup>5,6</sup></b>
2	Commercial Refrigerators –Transparent and Solid Door Types	No current standard	<p>The new requirement varies by type and size of unit, establishing a maximum allowed kWh use per day based on design and size.</p> <p>Modifications: may include substituting interior lighting with T-8 lamps and electronic ballasts; may also include variable-speed compressors, improved insulation, or higher-efficiency fans, motors, or compressors.</p>	<p>Number of new units sold in California (transparent door units and solid door units respectively): 33,750 and 11,250</p> <p>Coincident demand factor: 70% for both</p> <p>Energy savings per individual unit: 1504 and 2064 kWh/yr</p> <p>Energy savings for this whole class of appliance: 42 GWh/yr taken together</p> <p>Peak demand savings: 13 MW taken together</p>	<p>EMISSIONS: Emissions reductions in Western states due to reduced electricity demand:</p> <p>NO<sub>x</sub> reduction: 8 tons/yr taken together</p> <p>CO<sub>2</sub> reduction: 25,200 tons/yr taken together</p> <p>PM10 reduction: 1.3 tons/yr taken together</p> <p>MATERIALS: lamp change will reduce material demand. Switching from magnetic to electronic ballasts will reduce demand for copper. Use of higher-efficiency fans, motors, or compressors or improved insulation can rely on existing available technology. No significant effects on the environment will occur.</p>

	<b>Appliance Type</b>	<b>Existing Standard</b>	<b>Proposed Standard or Description of Changes</b>	<b>Estimated Energy Effects<sup>5</sup></b>	<b>Potential Environmental Issues<sup>5,6</sup></b>
3	Emergency Lighting (Exit Signs)	No current standard	Limits the wattage of each illuminated face of exit signs to 5 watts.  Modifications: required use of LED or LEC type lights.	Number of new units sold in California annually: 160,000  Coincident demand factor: 100%  Energy savings per individual unit: 315 kWh/yr  Energy savings for this whole class of appliance: 50 GWh/yr  Peak demand savings: 6 MW	EMISSIONS: Emissions reductions in Western states due to reduced electricity demand:  NO <sub>x</sub> reduction: 9.7 tons/yr CO <sub>2</sub> reduction: 30,275 tons/yr PM10 reduction: 1.5 tons/yr  MATERIALS: LEDs and LECs require fewer materials to manufacture than incandescent or fluorescent lights. No significant effects on the environment will occur.
4	Traffic Signals	No current standard	The new standard varies depending on the color and outdoor air temperature used in the testing. Wattage per module (a module is one light of the traffic signal, either red, amber, green, or a turn arrow) varies between 8 to 22 watts depending on the LED's color, size, and the testing temperature used.  Modifications: required use of LED-type lights.	Number of new traffic signal modules installed in California annually: 1,000,000 Coincident demand factor: 34%  Energy savings per individual module: 300 kWh/yr  Energy savings for this whole class of appliance: 300 GWh/yr  Peak demand savings: 12 MW	EMISSIONS: Emissions reductions in Western states due to reduced electricity demand:  NO <sub>x</sub> reduction: 57 tons/yr CO <sub>2</sub> reduction: 180,000 tons/yr PM10 reduction: 9 tons/yr  MATERIALS: LEDs take fewer materials to manufacture than the incandescent technology traditionally used. No significant effects on the environment will occur.

	<b>Appliance Type</b>	<b>Existing Standard</b>	<b>Proposed Standard or Description of Changes</b>	<b>Estimated Energy Effects<sup>5</sup></b>	<b>Potential Environmental Issues<sup>5,6</sup></b>
5	Torchieres	No current standard	<p>Torchieres would be allowed a maximum lighting wattage of 190 watts. The lamp will be designed to become non-operational if more than 190 watts are installed.</p> <p>Modifications: no incandescent or high-wattage halogen light bulbs will be allowed, and a control mechanism for disallowing over 190 watts must be installed.</p>	<p>Number of new units sold in California annually: 1,300,000</p> <p>Coincident demand factor: 25%</p> <p>Energy savings per individual unit: 394 kWh/yr</p> <p>Energy savings for this whole class of appliance: 512 GWh/yr</p> <p>Peak demand savings: 49 MW</p>	<p>EMISSIONS: Emissions reductions in Western states due to reduced electricity demand:</p> <p>NO<sub>x</sub> reduction: 98.1 tons/yr CO<sub>2</sub> reduction: 307,320 tons/yr PM10 reduction: 15.4 tons/yr</p> <p>MATERIALS: Using low wattage lamps, or going from two to one lamp, will result in reductions for all associated materials. It is anticipated that fuses will be used to limit wattage. The increase in materials from manufacture of fuses will be insignificant - a very small fraction of present California market requirements for wire and perhaps glass. No significant effects on the environment will occur.</p>



	<b>Appliance Type</b>	<b>Existing Standard</b>	<b>Proposed Standard or Description of Changes</b>	<b>Estimated Energy Effects<sup>5</sup></b>	<b>Potential Environmental Issues<sup>5,6</sup></b>
6	Commercial Clothes Washers	No current standard	<p>The proposed standard varies depending on the type and size of unit. The requirements are for both minimum Modified Energy Factor and maximum Water Factor.</p> <p>Modifications: more efficient motors and gearing, possible changes to the drum and drainage system.</p>	<p>Number of new units sold in California annually: 50,000</p> <p>Coincident demand factor: 40%</p> <p>Energy savings per individual unit: 412 kWh/yr</p> <p>Energy savings for this class of appliance: 21 GWh/yr</p> <p>Peak demand savings: 4 MW</p> <p>Natural gas savings resulting from reduced operation of clothes dryers for all clothes dryers: 350,000 MMBtu</p>	<p>EMISSIONS: Emissions reductions in Western states due to reduced electricity demand:</p> <p>NO<sub>x</sub> reduction: 3.9 tons/yr CO<sub>2</sub> reduction: 12,360 tons/yr PM10 reduction: 0.62 tons/yr</p> <p>Emission reductions in California resulting due to reduced natural gas use:</p> <p>NO<sub>x</sub> reduction: 16 tons/yr CO<sub>2</sub> reduction: 20,125 tons/yr PM10 reduction: 1.75 tons/yr</p> <p>MATERIALS: The improvements in performance are obtained without significantly changing the quantities of raw materials used. No significant effects on the environment will occur.</p>

	<b>Appliance Type</b>	<b>Existing Standard</b>	<b>Proposed Standard or Description of Changes</b>	<b>Estimated Energy Effects<sup>5</sup></b>	<b>Potential Environmental Issues<sup>5,6</sup></b>
7	Transformers	No current standard. For low-voltage transformers, depending on size and type, current efficiencies range from 85-92%.	<p>The proposed standard will cover single- and three-phase low voltage dry-type transformers. The minimum required efficiency would be between 97 and 98.9% (resulting in efficiency increases of 5 to 12%).</p> <p>Modifications: Switching from aluminum to copper in the windings.</p>	<p>Number of new units sold in California annually: 10,000</p> <p>Coincident demand factor: 100%</p> <p>Energy savings per individual unit: 2,690 kWh/yr</p> <p>Energy savings for this whole class of appliance: 27 GWh/yr</p> <p>Peak demand savings: 3 MW</p>	<p>EMISSIONS: Emissions reductions in Western states due to reduced electricity demand:</p> <p>NO<sub>x</sub> reduction: 5.15 tons/yr CO<sub>2</sub> reduction: 16,140 tons/yr PM10 reduction: 0.81 tons/yr</p> <p>MATERIALS: Very small quantities of additional copper will be used in transformers. The change from aluminum to copper will actually lower overall processing (embodied) energy needed to mine and refine, since processing aluminum from raw ore is highly energy-intensive compared to copper. No significant effects on the environment will occur.</p>
8	Ground Water and Ground Source Heat Pumps	The current standard is between 10 and 11.0 EER and a COP of 3.5.	<p>The proposed standard is based on different testing criteria. The new EER will range from 13.4 to 16.2, and the COP will be between 3.1 and 3.6.</p> <p>Modifications: The change is in the testing methods only; there is no intent to change design and no need for equipment modifications.</p>	Not applicable	Not applicable. Since this change is a testing procedure change, the industry as a whole will make no actual changes in equipment or materials. Therefore, there are no emissions reductions, and no significant effects on the environment will occur.

	<b>Appliance Type</b>	<b>Existing Standard</b>	<b>Proposed Standard or Description of Changes</b>	<b>Estimated Energy Effects<sup>5</sup></b>	<b>Potential Environmental Issues<sup>5,6</sup></b>
9	Tub Spout Diverters	0.1 to 0.3 gpm (maximum leakage rate in gallons per minute)	<p>0.01 to 0.05 gpm (maximum leakage rate in gallons per minute)</p> <p>Modifications: Manufacturing specifications for some models must be changed to eliminate leakage. Many units already meet this standard.</p>	<p>Number of new units installed in California annually: 195,000 on systems that heat water with natural gas</p> <p>Coincident demand factor: 25%</p> <p>Savings in natural gas from preventing leakage of hot water through the bathtub faucet during showers, per unit: 1.2 therm</p> <p>Savings in natural gas from preventing leakage of hot water through the bathtub faucet during showers, all units taken together: 23,400 MMBtu</p>	<p><b>EMISSIONS:</b> Reductions in emissions both in California (from natural gas combustion at water heaters) and across the Western states (from electricity generation at power plants).</p> <p><b>Gas (within California):</b>  NO<sub>x</sub> reduction: 1.1 tons/yr  CO<sub>2</sub> reduction: 1,345 tons/yr  PM10 reduction: 0.12 tons/yr</p> <p><b>MATERIALS:</b> It is anticipated that further use of known compatible components and more attention to machining and assembly details during manufacture will eliminate leakage; no added materials will be required. No significant effects on the environment will occur.</p>

	<b>Appliance Type</b>	<b>Existing Standard</b>	<b>Proposed Standard or Description of Changes</b>	<b>Estimated Energy Effects<sup>5</sup></b>	<b>Potential Environmental Issues<sup>5,6</sup></b>
10	Residential Central Air Conditioners and Heat Pumps (under 65,000 Btu output)	Air-cooled air conditioners: SEER 13	Up to Dec. 31, 2005: SEER 13 and EER 11.3  Starting Jan. 1, 2006: SEER 13 and EER 11.6  A thermostatic expansion valve (TXV) is required in both cases.	Number of new units sold in California annually: 205,000  Coincident demand factor: 50%  Energy savings per individual unit: 68 kWh/yr  Energy savings for this whole class of appliance: 14 GWh/yr  Peak demand savings: 7 MW	EMISSIONS: Emissions reductions in Western states due to reduced electricity demand:  NO <sub>x</sub> reduction: 2.65 tons/yr CO <sub>2</sub> reduction: 8,312 tons/yr PM10 reduction: 0.42 tons/yr  MATERIALS: An increase in the condensing or evaporator coil size will increase demand for aluminum, though the increase will be insignificant in comparison to total aluminum demand in California. Improved compressors or addition of thermostatic expansion valves would require insignificant amounts of aluminum, copper, and/or steel. <sup>7</sup> Expansion of coil size will also increase demand for refrigerant. <sup>8</sup> High efficiency fans use less material than previous fan designs or the same amount. Many units being sold in California already meet the proposed efficiency requirements. No significant effects on the environment will occur.
		Air source heat pumps: HSPF 7.7	Same SEER and EER levels as for air-cooled air conditioners, plus HSPF 7.9 for both time periods.		
		Note: these are newly adopted Federal standards.	Modifications: installation of thermostatic expansion valves and possible increase in size of condensing and evaporator coils; elimination of multi-speed compressors; use of high efficiency compressors; or use of high efficiency fans.		

<sup>7</sup> Based on the projection of increased coil size, and assuming 200,000 new units per year with an average size of 48,000 Btu/hr output, copper demand will increase by an estimated 2,447 tons per year. In comparison, the 1998 demand for copper in the U.S. was 3,120,000 tons. This means that the demand for copper will increase by less than eight hundredths of a percent, an amount staff deems negligible. Aluminum demand will increase by an estimated 2,559 tons per year. The 1999 demand for aluminum in the U.S. was 7,900,000 tons. This means that the total increase will expand the demand for aluminum by less than four hundredths of a percent, an amount staff deems negligible. See Appendix B for references for these data.

	Appliance Type	Existing Standard	Proposed Standard or Description of Changes	Estimated Energy Effects <sup>5</sup>	Potential Environmental Issues <sup>5,6</sup>
11	Commercial Air Conditioners			Number of new units sold in California annually: 36,000	<p>EMISSIONS: Emissions reductions in Western states due to reduced electricity demand:</p> <p>NO<sub>x</sub> reduction: 202 tons/yr CO<sub>2</sub> reduction: 633,528 tons/yr PM10 reduction: 31.7 tons/yr</p> <p>MATERIALS: Expansion of condensing and evaporative coils will increase demand for aluminum; use of high-efficiency compressors will add copper; and use of thermostatic expansion valves will add steel. The very small amount of metals from each of these changes is insignificant compared to the total demand for these materials in California. Expansion of coil size will also increase demand for refrigerant. High efficiency fans use less material than previous fan designs or the same amount. Many units on the market already meet the proposed efficiency requirements. No significant effects on the environment will occur.</p>
	Output between 65,000 and 135,000 Btu	EER 8.9	EER 11	Coincident demand factor: 80%	
	Output between 135,000 and 240,000 Btu	EER of 8.5	EER 10.8	Energy savings per individual unit: 2,790 kWh/yr	
			Modifications: installation of thermostatic expansion valves; possible size increase of both condensing and evaporator coils; use of high efficiency compressors; use of high efficiency fans; or elimination of multi-speed compressors.	<p>Energy savings for this whole class of appliance: 1,056 GWh/yr</p> <p>Peak demand savings: 28 MW</p>	

<sup>8</sup> The refrigerant most used in California air conditioners is chlorodifluoromethane, or R-22, considered a moderate threat to the ozone layer. Assuming five additional pounds of refrigerant for each residential unit and nine additional pounds for each commercial unit, the estimated increase in refrigerant is 1,000,000 pounds, or 500 tons, for the residential sector and 234,000 pounds, or 117 tons, for the commercial sector. The 1999 demand for R-22 (HCFC-22) in the Northern Hemisphere was about 238,000 metric tons, or 262,000 tons. Assuming R-22 for all 617 tons, the percent increase resulting from the proposed California standards amounts to). In consultation with the Energy Commission's Environmental Protection Office, Energy Efficiency staff deemed this quantity negligible.

<b>TOTAL CUMULATIVE EFFECT OF APPLIANCE STANDARDS</b>	<b>Annual energy savings: 2,042 GWh/yr</b>  <b>Total peak demand reduction: 124.3 MW</b>  <b>Natural gas savings: 373,400 MMBtu</b>	<b>EMISSIONS: reduction in Western states (tons per year):</b> <ul style="list-style-type: none"> <li>• NO<sub>x</sub> 391</li> <li>• CO<sub>2</sub> 1.2 million</li> <li>• PM10 61</li> </ul> <b>EMISSIONS: emissions reduction at sites of gas combustion in California (tons per year):</b> <ul style="list-style-type: none"> <li>• NO<sub>x</sub> 17</li> <li>• CO<sub>2</sub> 21,470</li> <li>• PM10 1.8</li> </ul>
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## Appendix B – References and Support Documentation

### I. References

**Assembly Bill 970, The California Energy Security and Reliability Act of 2000**, approved by the Governor on September 6, 2000, and filed with the Secretary of State September 7, 2000. Available at [http://www.energy.ca.gov/efficiency/ab970/documents/ab\\_970\\_text.html](http://www.energy.ca.gov/efficiency/ab970/documents/ab_970_text.html).

*California Energy Commission Initial Statement of Reasons for Proposed Amendments to California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4: Appliance Efficiency Regulations and California Code of Regulations, Title 24: Part 6, Subchapter 2: Building Standards, California Energy Commission*, Docket No. 01-AB970-APSTD, November 2001.

*California Statistical Abstract, California Department of Finance*, Sacramento, California, October 2000. Available at [http://www.dof.ca.gov/html/fs\\_data/STAT-ABS/sec\\_1.htm](http://www.dof.ca.gov/html/fs_data/STAT-ABS/sec_1.htm).

*California Energy Commission Express Terms (45-Day Language), Proposed Amendments to California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601 - 1608: Appliance Efficiency Regulations and California Code of Regulations, Title 24: Part 6, Subchapter 2, Sections 110 - 111: Building Standards, California Energy Commission*, Docket No. 01-AB970-APSTD, November 2001.

**The Rising Profile of Power Quality – Market Highlights, The Power Quality Group** (an E-Source/Electrotek Power Quality Alliance), <http://pqgroup.com/highlights.html>, date of publication not given.

*2001 Update, Assembly Bill 970 Draft Appliance Efficiency Standards, Life Cycle Cost Analysis, California Energy Commission*, Publication No. P400-01-028, Docket No. 01-AB970-APSTD, November 2001.

### II. Support documentation for Appendix A

#### **Beverage Vending Machines**

Noah Horowitz, Natural Resource Defense Council. email to Michael Martin of the Energy Commission, November 2, 2000. Notes that 40 watts is the assumed savings per vending machine; number of units sold annually is based on 15% of national.

Rachel Schmeltz, United States Environmental Protection Agency (US EPA), fax to Michael Martin, November 1, 2000. Includes values for unit energy savings.

#### **Commercial Refrigerators (transparent and solid door models)**

Steven Nadel, American Council for an Energy Efficient Economy, email to Michael Martin, November 7, 2000. Includes estimated energy savings for California of 42 GWh/yr.

Arthur D. Little (ADL), “Energy Saving Potential for Commercial Refrigeration Equipment,” prepared for the Building Equipment Division, Office of Building Technologies, United States Department of Energy (US DOE), June 1996. Report is referenced in the Nadel report that 30-35% savings can be achieved.

The Cadmus Group Inc., “Preliminary Engineering Analysis of Commercial Reach-in Refrigerators and Freezers,” prepared for Energy Star® Program, Climate Protection Division, US EPA, February 2000. Unit energy savings of 35 percent are defined.

### **Emergency Lighting (Exit Signs)**

Patrick Eilert, Pacific Gas & Electric Company, “Energy Efficient Exit Signs,” September 29, 2000.

### **Traffic Signals**

Email from Virginia Lew to Jim Holland, both of the Energy Commission, November 2, 2000.  
Estimated energy savings for converting traffic signals.

### **Torchieres**

Noah Horowitz, Natural Resources Defense Council, November 2, 2000, “Proposal for Inclusion of a Torchiere Power Use Standard in the California Energy Commission’s Title 20 Rulemaking,” report emailed to Michael Martin, November 2, 2000.

### **Commercial Clothes Washers**

Ted Pope, Energy Solutions, “Preliminary Findings on Commercial Clothes Washers,” draft report dated November 2, 2000, emailed to Jim Holland of the Energy Commission, November 3, 2000.

### **Distribution Transformers**

Robert Huang, The Cadmus Group Inc., “Energy Star®-labeled Commercial and Industrial Transformers,” report attached to letter to Michael Sloss of the Energy Commission, July 21, 2000.  
Used by Commission staff to develop data on energy and peak savings.

### **Tub Spout Diverters**

Calculation for tub spout diverters submitted by Michael Martin, April 16, 2001.

### **Residential Air Conditioners**

A. DeLaski, Appliance Standards Awareness Project (ASAP), November 8, 2000, via email to Michael Martin of the Energy Commission

Mark Kendall, A.D. Little, February 5, 2001, via email to the Commission’s Rob Hudler.

Copper demand and aluminum demand for 1998 and 1999 respectively are found at the U.S. government website <http://minerals.usgs.gov/minerals/pubs/commodity/copper/>.

### **Commercial Air Conditioners**

Steve Nadel, American Council for an Energy Efficient Economy (ACEEE), November 7, 2000, via email to Michael Martin of the Energy Commission.



### **Both Types of Air Conditioners**

*California Statistical Abstract*, **California Department of Finance**, Sacramento, California, October 2000. Available at [http://www.dof.ca.gov/html/fs\\_data/STAT-ABS/sec\\_I.htm](http://www.dof.ca.gov/html/fs_data/STAT-ABS/sec_I.htm).

Mark Kendall, A.D. Little, February 5, 2001, via email to the Commission's Rob Hudler.

*Production, Sales, and Atmospheric Release of HCFC-22 through 1991*, **Alternative Fluorocarbons Environmental Acceptability Study**, RAND Environmental Science & Policy Center, Arlington, VA, 1992c. [http://www.afeas.org/production\\_and\\_sales.html](http://www.afeas.org/production_and_sales.html).

Greg Rosenquist, Lawrence Berkeley National Lab, to Michael Martin of the Energy Commission.

US government website [www.epa.gov/globalwarming/emissions/national/trends.html](http://www.epa.gov/globalwarming/emissions/national/trends.html).

US government website <http://minerals.usgs.gov/minerals/pubs/commodity/copper/>.

**Table 1. Emissions Factors for Calculating Reduced Emissions from Energy Savings**

<b>Emissions Factors</b>	<b>NO<sub>x</sub></b>	<b>CO<sub>2</sub></b>	<b>PM10</b>
<b>Natural Gas, California (lbs/MMBtu)</b>	<b>0.094</b>	<b>115</b>	<b>0.01</b>
<b>Electricity, Western States (lbs/MWh)</b>	<b>0.383</b>	<b>1200</b>	<b>0.06</b>

## Appendix C – Glossary of Terms

### ***Appliance Standards***

The California Appliance Energy Efficiency Standards as set forth in the *California Code of Regulations*, Title 20, Division 2, Chapter 4, Article 4, Sections 1601-1608, and referenced in the *California Code of Regulations*, Title 24, Part 6, Subchapter 2.

### ***ASHRAE***

American Society of Heating, Refrigerating and Air Conditioning Engineers.

### ***Btu/hr (Btuh)***

British thermal unit per hour. One Btu equals the amount of heat needed to raise the temperature of one pound of water one degree Fahrenheit. Used for measuring heating and cooling equipment output.

### ***Coefficient of Performance (COP)***

The ratio of heat output to the total power input in consistent units.

### ***Coincident Demand Factor***

That fraction of the population of devices (or component thereof) operating at any instant during a peak demand period of any particular day or season.

### ***Commercial Refrigerator, Refrigerator-Freezer or Freezer***

A refrigerator, refrigerator-freezer, or freezer that is not a federally-regulated consumer product.

### ***CO<sub>2</sub>***

Carbon dioxide, a gas by-product of combustion that is known to behave as a greenhouse gas in the earth's atmosphere.

### ***COP* see *Coefficient of Performance***

### ***Embodied Energy***

The energy consumed by all of the processes associated with the production of a material or building, including the acquisition of natural resources, transport at all stages of production, processing and manufacturing of all related materials and equipment, and eventual disposal. Also called cradle-to-grave energy.

### ***EER (Energy Efficiency Ratio)***

The ratio of cooling capacity of an air conditioning unit in Btus per hour to the total electrical input in watts under specified test conditions. Compare to *SEER*.

### ***Energy Factor***

For clothes washers, the cubic foot capacity per kWh per cycle, as determined using the applicable test method in Section 1604(p).

***Gigawatt-hour (GWh)***

One thousand megawatt-hours, one million kilowatt-hours, or one billion watt-hours of electrical energy.

***Heat Pump Pool Heater***

An air-to-air heat pump pool heater, employing a compressor, water-cooled condenser, and outdoor air coil in a single package assembly.

***Illuminated Exit Sign***

An internally-illuminated sign that is designed to be permanently fixed in place and used to identify an exit, usually an emergency exit in a nonresidential building.

***Kilowatt (kW)***

One thousand watts of power. A kilowatt is a measure of demand, or how many thousand watts are being drawn at any instant.

***Kilowatt-hour (kWh)***

One thousand watt-hours of energy.

***LEC see Light Emitting Capacitor******LED see Light Emitting Diode******Light Emitting Capacitor (LEC)***

A solid-state device that produces light when an electric current is passed through a phosphor-impregnated material.

***Light Emitting Diode (LED)***

A solid-state device that emits light when an electric current is applied.

***MBtu***

One thousand Btus of energy.

***Megawatt (MW)***

One million watts of power. A megawatt is a measure of demand or how many million watts are being draw at any instant (*see also* kilowatt).

***Minimal Efficiency***

The ratio of power output to power input expressed as a percent, as determined using the applicable test method.

***MMBtu***

One million Btus of energy.

***Modified Energy Factor***

For a clothes washer, the quotient of the cubic foot capacity of the clothes container divided by the total clothes washer's energy consumption per cycle, as determined using the appropriate test method in Sections 1604(m) and 1604(p).

***NAECA***

The National Appliance Energy Conservation Act, 42 U.S.C. Section 6291 et seq.

***NO<sub>x</sub>***

Oxides of nitrogen, usually NO and NO<sub>2</sub>, that are chief components of air pollution and produced by the combustion of fossil fuels.

***PM10***

Solid particulate matter that is 10 microns in size or smaller. Usually considered pollutants, particulates are released from combustion processes in exhaust gases at fossil fuel plants and from mobile and other fugitive particle sources.

***Rated power of a traffic signal module***

The power consumption that the module was designed and tested for at ambient temperatures of 25°C and 74°C.

***Standards***

The *California Building Energy Efficiency Standards* as set forth in the *California Code of Regulations*, Title 24, Part 6.

***Therm***

100,000 Btus.

***Traffic signal***

The unit that holds the red, yellow, and green traffic control lights and sometimes turn arrows as well.

***Traffic signal module***

An individual color (red, yellow, green or various colors of turn arrows) in a traffic signal.

***Water Factor***

For clothes washers, the quotient of the total weighted per-cycle water consumption divided by the capacity of the clothes washer, determined using the applicable test method in 1604(p).

***Watt (W)***

A unit of measure of electric power at a point in time, as capacity or demand.

***Watt-hour (Wh)***

One watt of power expended for one hour.